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A Preliminary Report on the Stock Composition of
the Florida East Coast Winter Fishery for King Mackerel, Jan-Mar 2000

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Recently, the stock composition of the east Florida winter fishery for king mackerel was estimated using otolith shape data and a maximum likelihood estimation procedure (DeVries et al., Submitted to Fisheries Research). That study estimated that 99.8% of the king mackerel landed in the 1996-97 winter fishery were from the Atlantic stock, while only 0.2% were from the eastern Gulf stock, with a standard error of 3.4%.

In a first attempt to assess the temporal variability of these estimates, the same maximum likelihood procedure was used to estimate the stock composition of the 1999-2000 winter fishery. The estimate for 1999-2000 was derived from 280 female king mackerel 80-96 cm FL collected Jan 19- Mar 14, 2000 in Indian River, St. Lucie, Martin, and Palm Beach counties. The size, temporal, and geographical distributions of those samples are shown in Figures 1-3. The training data set used in the maximum likelihood procedure was the same one used in the original study and was derived from fish of known stock origin collected during the summer of 1996.

The maximum likelihood procedure estimated the stock composition of the 1999-2000 winter fishery to be 100% Atlantic stock with a standard error of 3.9%, which is very close to the estimate of 99.8% for 1996-97. The estimated empirical 90% confidence interval, derived from a bootstrap with 500 replications, on the proportion from the Atlantic was 89.1% to 100.0% . These results suggest that the estimates are temporally quite stable.

One weakness of this analysis is that we used the 1996 training data set in the maximum likelihood procedure rather than generating a new one from data collected in 1999. Additionally, because we got a late start in collecting samples, the temporal distribution of the 2000 study differed from that of the 1996-97 study. Most of the samples in the original study were collected in December, while in the 2000 study most were collected between late January and mid-March. The size and geographical distributions of the samples were similar in both studies.

I am currently collaborating with Will Patterson at LSU on some additional work on this stock composition problem, and this work will not have the weaknesses mentioned above. Will is going to look at the chemical composition of otoliths that I will do shape analysis on, and hopefully we'll get the same answers. Fish of known origin were collected from the eastern Gulf and the Atlantic last summer, and sampling of the winter fishery began at the start on the season in late 2000 and will continue through March. This data won't be ready for this years MSAP meeting but will be ready by next year.

Literature Cited

DeVries, D.A., C.B. Grimes, and M.H. Prager. Using otolith shape analysis to distinguish eastern Gulf of Mexico and Atlantic Ocean stocks of king mackerel. Submitted to Fisheries Research.

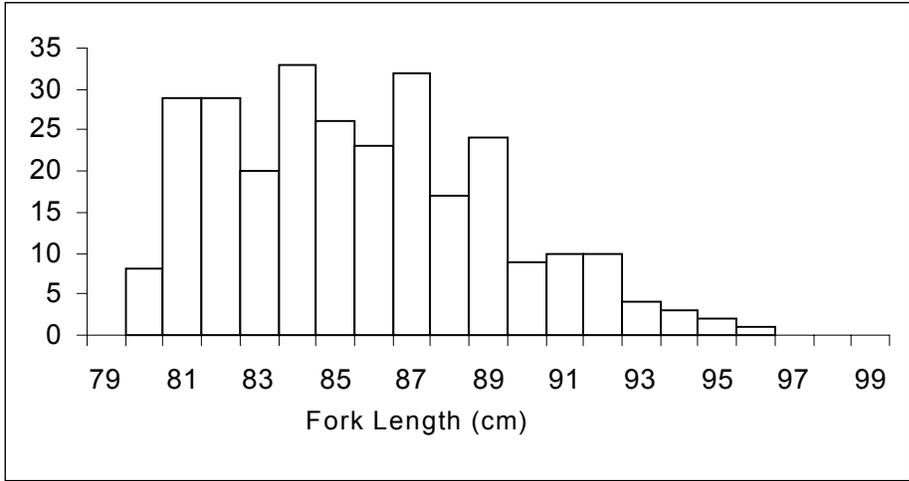


Figure 1. Size composition of winter fishery king mackerel samples, Jan.- Mar. 2000.

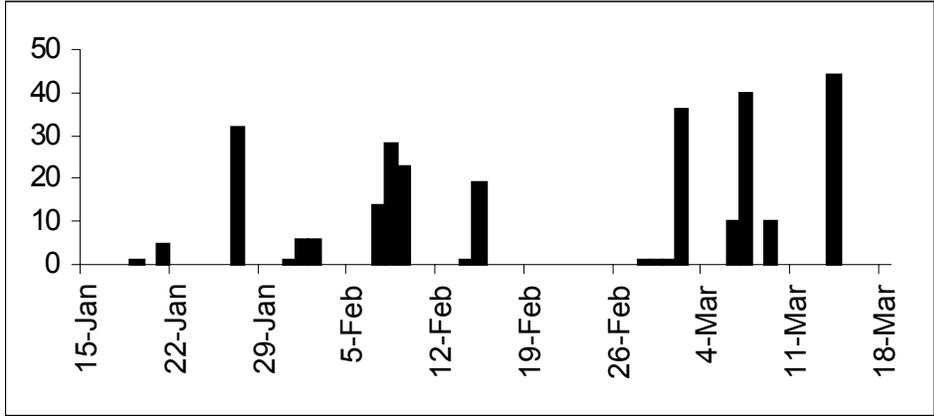


Figure 2. Temporal distribution of winter fishery king mackerel samples, Jan.- Mar. 2000.

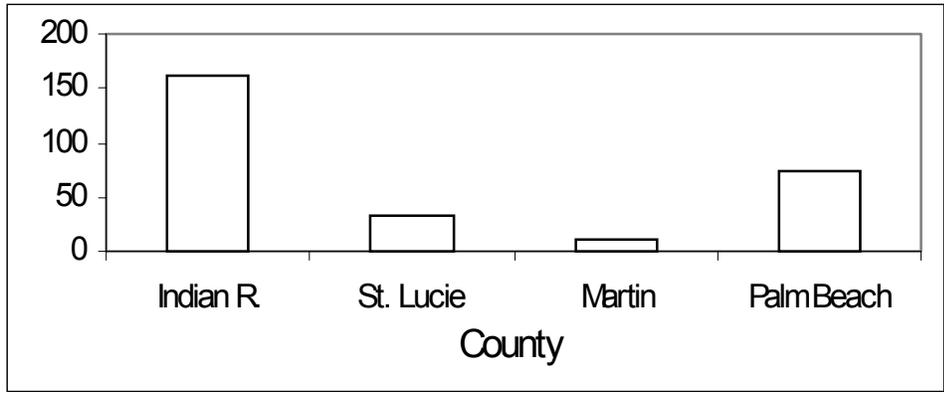


Figure 3. Geographical distribution of winter fishery king mackerel samples, Jan.- Mar. 2000.